

AMENDMENT TO THE CLAIMS.

1. (Canceled)
2. (Canceled)
3. (Canceled)
4. (Canceled).
5. (Canceled)
6. (Canceled)
7. (Canceled)
8. (Canceled)

9. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate; wherein said Silicon Carbide substrate further includes a plurality of N Silicon Carbide layers; wherein said first Silicon Carbide layer includes a bottom surface of said Silicon Carbide substrate; wherein said last N-th layer includes a top surface of said Silicon Carbide substrate; each said subsequent k-th layer overlying said preceding (k-1)-th layer; each said k-th Silicon Carbide layer having a k-th conductivity type selected from the group consisting of: {~~said~~ a first conductivity type; and ~~said~~ a second conductivity type}; each said k-th Silicon Carbide layer having a k-th dopant concentration; each said subsequent k-th Silicon Carbide layer being grown on said preceding (k-1)-th Silicon Carbide layer; k is an integer greater than 1, k is an integer less or equal to N, N is an integer;

a bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

10. (Original) The structure of claim 9, wherein at least one said k-th Silicon Carbide layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process Silicon Carbide layer or an epitaxially grown by a molecular beam epitaxy (MBE) process Silicon Carbide layer.

11. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate; wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a

conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;

a bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said single crystal Silicon semiconductor material further includes a plurality of M single crystal Silicon semiconductor material layers; wherein said first single crystal Silicon semiconductor material layer includes a bottom surface of said single crystal Silicon semiconductor material; wherein said last M-th layer includes a top surface of said single crystal Silicon semiconductor material; each said subsequent i-th layer overlying said preceding (i-1)-th layer; each said i-th single crystal Silicon semiconductor material layer having an i-th conductivity type comprising said first conductivity type, or said second conductivity type; each said i-th single crystal Silicon semiconductor material layer having an i-th dopant concentration; each said subsequent i-th single crystal Silicon semiconductor material layer being grown on said preceding (i-1)-th single crystal Silicon semiconductor material layer; i is an integer greater than 1, i is an integer less or equal to M, M is an integer.

12. (Original) The structure of claim 11, wherein at least one said i-th single crystal Silicon semiconductor material layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process single crystal Silicon semiconductor material layer, or an epitaxially grown by a molecular beam epitaxy (MBE) process single crystal Silicon semiconductor material layer.

13. (Canceled)

14. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate; wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;

a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:

a Silicon layer;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer.

15. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:

a carbon layer;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

16. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:

a Silicon germanium (SiGe) layer;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

17. (Currently Amended) ~~The structure of claim 2;~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:

a metal silicided layer selected from the group consisting of: {a tungsten silicide layer; a titanium silicide layer; and a cobalt silicide layer};

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

18. (Currently Amended) ~~The structure of claim 2 further including:~~

A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a bonding layer overlying said Silicon Carbide substrate;

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

and

at least one separation plug formed in said Silicon semiconductor material; said separation plug extending from said top surface of said Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said Silicon semiconductor material, said first active/passive structure extending from said top surface of said Silicon semiconductor material into said Silicon semiconductor material at a first active/passive structure depth

level, said second active/passive structure extending from said top surface of said Silicon semiconductor material into said Silicon semiconductor material at a second active/passive structure depth level;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

19. (Original) The structure of claim 18, wherein said separation plug further includes:

a trench filled with a material selected from the group consisting of:

an oxide material, polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.

20. (Canceled)

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30. (Canceled)

31. (Canceled)

32. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material being grown on said Silicon Carbide substrate;

and

at least one separation plug formed in said single crystal Silicon semiconductor material; said separation plug extending from said top surface of said single crystal Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said single crystal Silicon semiconductor material, said first active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a first active/passive structure depth level, said second active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a second active/passive structure depth level;

wherein said Silicon Carbide substrate is of a conductivity type selected

from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

33. (Original) The structure of claim 32, wherein said separation plug further includes:

a trench filled with a material selected from the group consisting of:

an oxide material, a polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.

34. (Canceled)

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41. (Canceled)

42. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said Silicon Carbide substrate further includes a plurality of N Silicon Carbide layers; wherein said first Silicon Carbide layer includes a bottom surface of said Silicon Carbide substrate; wherein said last N-th layer includes a top surface of said Silicon Carbide substrate; each said subsequent k-th layer overlying said preceding (k-1)-th layer; each said k-th Silicon Carbide layer having a k-th conductivity type comprising said first conductivity type, or said second conductivity type; each said k-th Silicon Carbide layer having a k-th dopant concentration; each said subsequent k-th Silicon Carbide layer being grown on said preceding (k-1)-th Silicon Carbide layer; k is an integer greater than 1, k is an integer less or equal to N, N is an integer.

43. (Original) The structure of claim 42, wherein at least one said Ak@-th Silicon Carbide layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process Silicon Carbide layer or an epitaxially grown by a molecular beam epitaxy (MBE) process Silicon Carbide layer.

44. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said single crystal Silicon semiconductor material further includes a plurality of M single crystal Silicon semiconductor material layers; wherein said first single crystal Silicon semiconductor material layer includes a bottom surface of said single crystal Silicon semiconductor material; wherein said last M-th layer includes a top surface of said single crystal Silicon semiconductor material; each said subsequent i-th layer overlying said preceding (i-1)-th layer; each said i-th single crystal Silicon semiconductor material layer having an i-th conductivity type comprising said first conductivity type, or said second conductivity type; each said i-th single crystal Silicon semiconductor material layer having an i-th dopant concentration; each said subsequent i-th single crystal Silicon semiconductor material layer being grown on said preceding (i-1)-th single crystal Silicon semiconductor material layer; i is an integer greater than 1, i is an integer less or equal to M, M is an integer.

45. (Original) The structure of claim 44, wherein at least one said i-th single crystal Silicon semiconductor material layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process

single crystal Silicon semiconductor material layer, or an epitaxially grown by a molecular beam epitaxy (MBE) process single crystal Silicon semiconductor material layer.

46. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

- a Silicon Carbide substrate;

- a double bonding layer overlying said Silicon Carbide substrate;

- and

- a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

- wherein said double bonding layer further comprises:

- a Silicon dioxide layer;

- and

- a Silicon germanium (SiGe) layer;

- wherein said Silicon Carbide substrate is attached to said Silicon dioxide layer; and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer.

47. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

- a Silicon Carbide substrate;

- a double bonding layer overlying said Silicon Carbide substrate;

- and

- a single crystal Silicon semiconductor material having a top surface; said

single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said double bonding layer further comprises:

a carbon layer;

and

a Silicon germanium (SiGe) layer;

wherein said Silicon Carbide substrate is attached to said carbon layer; and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer.

48. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said double bonding layer further comprises:

a metal silicided layer;

and

a Silicon germanium (SiGe) layer;

wherein said Silicon Carbide substrate is attached to said metal silicided layer;

and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer;

and wherein said metal silicided layer is selected from the group consisting of: a tungsten silicide layer; a titanium silicide layer; and a cobalt silicide layer.

49. (Previously Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

further including:

at least one separation plug formed in said single crystal Silicon semiconductor material;

said separation plug extending from said top surface of said single crystal Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said single crystal Silicon semiconductor material, said first active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a first active/passive structure depth level, said second active/passive structure extending from said top surface of said single crystal

Silicon semiconductor material into said single crystal Silicon semiconductor material at a second active/passive structure depth level.

50. (Original) The structure of claim 49, wherein said separation plug further includes:

a trench filled with a material selected from the group consisting of:

an oxide material, polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.